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PATENT APPLICATION

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IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Nanette C. Jensen, et al. **Confirmation No.:** 9811

Application No.: 09/855,208 **Examiner:** West, Jeffrey R.

Filing Date: May 14, 2001 **Group Art Unit:** 2857

Title: SYSTEM AND METHOD FOR DETERMINING LIGHT SOURCE CURRENT

Mail Stop Appeal Brief-Patents
Commissioner For Patents
PO Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

Sir:

Transmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed on **4/27/2005**.

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) $500.00.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

( ) (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d) for the total number of months checked below:

( ) one month $120.00
( ) two months $450.00
( ) three months $1020.00
( ) four months $1590.00

( ) The extension fee has already been filled in this application.

(X) (b) Applicant believes that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

Please charge to Deposit Account **08-2025** the sum of **$500.00**. At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees. A duplicate copy of this sheet is enclosed.

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Respectfully submitted,

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I hereby certify that this paper and the documents enclosed herewith are being deposited on the date indicated below with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop Appeal Brief - Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES

In re the application of: Nanette C. Jensen, et al.	Confirmation: 9811
Serial Number: 09/855,208	Art Unit: 2857
Filing Date: May 14, 2001	Examiner: West, Jeffrey R.
Title: SYSTEM AND METHOD FOR DETERMINING LIGHT SOURCE CURRENT	Docket No.: 10013325-1
	Appeal Number: ______________

APPEAL BRIEF UNDER 37 CFR §1.192

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P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is an appeal from the decision of Examiner Jeffrey R. West, Group Art Unit 2857, of December 28, 2004, rejecting claims 1-20 in the present patent application and making the rejection final.

I. REAL PARTY IN INTEREST:

The real party in interest is Hewlett-Packard Development Company, LP, a limited partnership established under the laws of the State of Texas and having a principal place of business at 20555 S.H. 249, Houston, Texas 77070, U.S.A. (hereinafter "HPDC"). HPDC is a Texas limited partnership and is a wholly-owned affiliate of Hewlett-Packard Company, a Delaware Corporation, headquartered in Palo Alto, CA. The general or managing partner of HPDC is HPQ Holdings, LLC.

II. RELATED APPEALS AND INTERFERENCES:

There are no other appeals or interferences known to appellant that will directly affect or be directly affected by or have a bearing on the Board's decision in the present pending appeal.

III. STATUS OF CLAIMS:

Claims 1-20 are currently pending in the present application. The Final Office Action mailed on December 28, 2004 rejected claims 1-4, 7-10, 13-16, 19, and 20 under 35 U.S.C. §103(a) as being unpatentable over US Patent 5,902,994 to Lisson et al. in view of US Patent 4,945,225 to Gamgee and US Patent 6,642,492 to Shiota et al. Also, claims 5, 6, 11, 12, 17, and 18 have been rejected under 35 U.S.C. §103(a) as being unpatentable over US Patent 5,902,994 to Lisson et al. in view of US Patent 4,945,225 to Gamgee and US Patent 6,642,492 to Shiota et al, and further in view of US Patent 4,982,203 to Uebbing et al. Applicants appeal the decision of the Examiner in rejecting claims 1-20. For the reasons set forth herein, Applicants respectfully submit that the rejection of the pending claims 1-20 should be overturned by the Board of Patent Appeals.

IV. STATUS OF AMENDMENTS:

With respect to claims 1-20, all amendments submitted with respect to such claims before the issuance of the Final Rejection have been entered.

V. SUMMARY OF CLAIMED SUBJECT MATTER:

The invention as set forth in the present claims is described in the specification at page 4, line 13 through page 7, line 17; page 9, lines 30-34; and page 12 line 5 through page 14, line 4. However, various related aspects of the present invention as described in the claims may be described elsewhere in the specification as well.

The present invention includes determining an optimum current that is to flow through each of the light sources 125 (FIG. 1) that may be light emitting diodes or other light sources in a scanner as depicted in FIG. 1. In this respect, the light

sources 125 generate light that illuminates a scan target that may be, for example, a sheet of paper, *etc*. The scanning of a document, for example, is accomplished by repeatedly scanning "lines" of pixels of the document. That is to say, the sensors 131 are arranged in a line within the sensor array 129 to acquire image information in lines as the document is moved relative to the sensor array 129 or vice versa. As illustrated in FIG. 1, to scan a line of pixels from the document, each of the light sources 125 is consecutively illuminated for a predetermined exposure time, thereby illuminating the document to be scanned. The light sources may comprise, for example, red, green, and blue light emitting diodes. The exposure time for the light sources may be independently set for any time period desired and is altered more than once during the calibration of the scanner 100.

For each of the light sources 125, each of the sensors 131 absorbs the light reflected from the document and generates a sensor value therefrom. The sensor values are then read out of the sensor array 129 and accessed by the processor 103 via the sensor signal processing interface 116.

In order to scan the hard copy document to obtain a faithful digital reproduction, the scanner 100 is calibrated from time to time for optimal operation. To calibrate the scanner 100, the scanner calibration logic 149 within the scanner is executed by the processor 103. When executed, the scanner calibration logic 149 executes several subroutines to ensure proper operation of the scanner 100. With reference to FIG. 5, a flow chart is shown that depicts an example of one of these subroutines. Specifically, a current subroutine 206 is shown that is executed in conjunction with scanner calibration logic 149 to determine an optimum current that is to flow through each of the light sources 125.

Beginning with block 280, the current subroutine 206 first determines the maximum exposure time for each colored light source 125 employed in the scanner 100. Note that the maximum exposure time may depend upon various factors including the speed at which the document progresses through the scanner 100 (FIG. 1) and the resolution of the sensors 131 (FIG. 1) employed to obtain the images from the document, *etc*. Thereafter, in block 282, the exposure time for each of the light sources 125 is set to the maximum allowable.

Then, in block 284 the magnitude of the current that flows through the respective light sources is set to a minimum value generated by an accompanying current control circuit in the scanner 100. Then, the current subroutine 206 moves to

block 286 in which a first scan of the sensors 131 is performed and the sensor values obtained therefrom are stored in memory 106 (FIG. 1). Thereafter, in block 288, all of the currents that flow through the respective light sources 125 that are not set to a finalized value are incremented by a predetermined amount by manipulating the current control circuit. Note that the first time that block 288 is encountered, all of the light emitting diode currents will not be set to a final value as the optimal current level for each has yet to be determined.

The current subroutine 206 then proceeds to block 290 in which a subsequent scan is performed of the sensors 131 and the corresponding sensor values are stored in the memory 106. Note that the newly determined current values from block 288 are applied to the light sources during the scan performed in block 290. Thereafter, in block 292 a loop is begun for each light source.

In block 294, the subsequent sensor values are compared to the first sensor values to determine whether the subsequent values are greater than the previous values by a predetermined percentage increase. Thereafter, in block 296, if the subsequent sensor values are greater than the prior sensor values by the predetermined percent increase, then the current subroutine 206 proceeds to block 298. On the other hand, if the percent increase has not been achieved in block 296, then the current subroutine 206 proceeds to block 300 in which the current for the present light emitting diode is set to the previous setting. Thereafter the current subroutine 206 progresses to block 298. In block 298, it is determined whether the comparison of block 294 has been performed for all of the light sources. If not, then the current subroutine 206 proceeds to block 302 in which the next light source is identified. Otherwise, the current subroutine 206 proceeds to block 304. Once the next light source is identified in block 302, then the current subroutine 206 reverts back to block 294.

In block 304, the current subroutine 206 determines whether all of the currents for each of the light emitting diodes and their corresponding colors has been set in block 300, or are at the maximum allowed current. If not, then the current subroutine 206 reverts back to block 288. Otherwise, the current subroutine 206 ends.

Thus, in one embodiment, the current subroutine 206 establishes the optimum current to flow through the respective light sources by starting at a low current value and increasing the currents in steps until a saturation of the sensors 131 is detected.

Note that the percent increase that is compared with respect to block 296 may be, for example, eight percent or other value.

Alternatively, in an alternative embodiment, a different approach may be taken in which the currents applied to the sensors 131 are decremented. For example, initially in block 284, the currents may be set to a maximum and the unset currents may be decremented in block 288. In such case, in block 296, the current subroutine 206 would detect a predefined percent decrease that indicates the saturation point of the sensors 131 has been identified.

In addition, claim 13 is the only independent claim involved in the appeal that includes means-plus-function elements. Specifically, Claim 13 recites "means for applying a first current to the LED for a first time period to generate a first measure of the light output of the LED from a number of sensors in a sensor array during the first time period" (i.e. page 12, lines 22-28, elements 284-286; page 22, line 4—page 23, line 14); "means for applying an altered current to the LED for a second time period to generate a second measure of the light output from the sensors in the sensor array during the second time period" (i.e. page 12 line 29—page 13, line 7, elements 288-290; page 22, line 4—page 23, line 14); and "means for detecting a saturation of the sensors in the sensor array by comparing a difference between the first measure of the light output and the second measure of the light output with a predefined difference threshold" (i.e. page 13, lines 8-21, elements 294, 296; page 22, line 4—page 23, line 14).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL:

Claims 1-4, 7-10, 13-16, 19, and 20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over US Patent 5,902,994 to Lisson et al. in view of US Patent 4,945,225 to Gamgee and US Patent 6,642,492 to Shiota et al. Also, claims 5, 6, 11, 12, 17, and 18 stand rejected under 35 U.S.C. §103(a) as being unpatentable over US Patent 5,902,994 to Lisson et al. in view of US Patent 4,945,225 to Gamgee and US Patent 6,642,492 to Shiota et al, and further in view of US Patent 4,982,203 to Uebbing et al.

VII. ARGUMENT:

Applicants believe that the simplest manner in which to examine the claim groups and rejections pertinent thereto is accomplished by looking at the key elements that the claims of the present application recite and that the cited prior art clearly lacks and does not allude to in combination. Accordingly, the Applicants herein discuss the traversal of the rejections in light of the exemplary claims 1 and 5, respectively.

A. REJECTION OF CLAIMS 1-4, 7-10, 13-16, 19, and 20:

Claims 1-4, 7-10, 13-16, 19, and 20 have been rejected under 35 U.S.C. §103(a) as being unpatentable over US Patent 5,902,994 to Lisson et al. (hereafter "Lisson") in view of US Patent 4,945,225 to Gamgee (hereafter "Gamgee") and US Patent 6,642,492 to Shiota et al. (hereafter "Shiota"). For the purposes of the following argument, Applicants discuss the traversal of the rejection of claims 1-4, 7-10, 13-16, 19, and 20 with a discussion of representative claim 1. It is noted that claims 7, 13, 19, and 20 include limitations similar in scope with those of claim 1, and that claims 2-4, 8-10, 14-16 depend from claims 1, 7, or 13. Claim 1 provides as follows:

> 1. A method for determining a light output of a light emitting diode (LED) in a scanner, comprising:
>
> applying a first current to the LED to generate the light output of the LED during a first time period;
>
> obtaining a first measure of the light output of the LED during the first time period with a number of sensors in a sensor array;
>
> applying an altered current to the LED to generate the light output of the LED during a second time period;
>
> obtaining a second measure of the light output of the LED during the second time period with the sensors in the sensor array; and
>
> detecting a saturation of the sensors in the sensor array by comparing a difference between the first measure of the light output and the second measure of the light output with a predefined difference threshold.

Applicants respectfully submit that claim 1 patently distinguishes over, and is not rendered obvious by the cited combination of Lisson, Gamgee, and Shiota.

1. The Combination of References Fails to Suggest All of the Claimed Limitations.

It is well settled law that a prima facie case of obviousness is established when the teachings from the prior art itself would appear to have shown or suggested the claimed subject matter to a person of ordinary skill in the art. In re Rijckaert, 9 F.3d 1531, 28 U.S.P.Q2d 1955, 1956 (Fed. Cir. 1993). With respect to claim 1, the Final Office Action maintains the rejection of the first Office Action stating verbatim in part:

> "Gamgee teaches a single discriminator including a light source and a sensing optical detector circuit that produces an output corresponding to the intensity of the light source (col. 3, lines 16-25) wherein saturation of the sensing optical detector circuit is detected by producing first and second magnitude outputs, at first and second times, relating to first and second light source intensities (col. 2, lines 49-58) and determining when a difference between the first and second outputs are not significant as compared to a predetermined significance value/threshold (col. 2, lines 65, to col. 3, line 11)." (Office Action, pages 3-4) (Emphasis Added)

Applicants argued that the above interpretation of Gamgee was improper. Applicants cited the text at column 2, lines 49-58 of Gamgee that states:

> "The discriminating apparatus of FIG. 2 acts as the detector 11 of FIG. 1 and includes an incidence signal sensing means 20 sensitive to an incident radiant signal 10 comprising both radiant information signal and radiant background signal to generate an output sensing signal 21 of a level related to the level of the incident signal 10. Detector means 22 is responsive to the sensing signal 21 to detect an information signal component of the sensing signal 21 from the background signal level component of the sensing signal 21." (Emphasis Added)

In response to the contentions of the first and final Office Actions, Applicants further argued that:

> "The sensing optical circuit does not produce first and second magnitude outputs at first and second times that are related to first and second light source intensities. Rather, an "incident radiant signal 10" (presumably a radiant light) falls onto an "incident signal sensing means 20". The "incident radiant signal 10" is a single radiant signal that comprises two separate components. These components are a "radiant information signal" (presumably a data signal) and a "radiant background signal" (presumably noise). However, the incident signal sensing means 20 only generates an output of a single magnitude. The discriminator circuit as taught by Gamgee is employed to maintain a bias of the sensor to facilitate differentiation between the various components of the input signal to identify the information in the signal as opposed to the noise. This is seen in the statement of Gamgee where "the sensing means 20 is sensitive to incident radiation and

generates an output sensing signal 21 of a level related to the intensity of incident radiation 10". Thus, only a single output sensing signal 21 is generated by the incident radiation on the sensor described." (Emphasis added)

In stating that Applicants' arguments were not persuasive in the Final Office Action, the Examiner cited the above argument by Applicants set forth in the Response of October 12, 2004 to the first Office Action and replied as follows:

> "The Examiner asserts that column 2, lines 49-58, of Gamgee is only included to teach that the detector circuit produces magnitude outputs related to incident light source intensities, specifically, "the discriminating apparatus of FIG. 2 acts as the detector 11 of FIG. 1 and includes an incident signal sensing means 20 sensitive to an incident radiation signal 10 comprising both radiant information signal and radiant background signal to generate an output sensing signal 21 of a level related to the level of the incident signal 10." (Final Office Action, pages 6-7) (Emphasis Added)

First, Applicants point out that in the first Office Action and the Final Office Action, the Examiner's cited column 2, lines 49-58 of Gamgee as showing or suggesting "wherein saturation of the sensing optical detector circuit is detected by producing first and second magnitude outputs, at first and second times, relating to first and second light source intensities (col. 2, lines 49-58)" as set forth above. Then, in the "Response to Arguments" on page 6 of the Final Office Action, the Examiner states that the cited portion of Gamgee was relied upon by the Examiner to teach the simple fact that the detector circuit produces magnitude outputs related to incident light source. Applicants objects to the apparent revision in the interpretation of Gamgee in this respect. Applicants' response to the Office Action of June 15, 2004 was predicated upon the rejection as stated.

In addition, Applicants have explained that Gamgee fails to show producing first and second magnitude outputs at first and second times as set forth in claim 1. Specifically, Gamgee further states in column 1, lines 10-27:

> "The apparatus of the present invention has been developed for use in relation to electronic apparatus for identification of objects including people and animals.... Such an identification system includes interrogator means which may comprise for example a directional light source for generating an information or interrogation signal and a radio frequency (RF) receiver for receiving the reply signal generated in response to the interrogation signal. Interrogator is used with one or more transponders, each of which includes a light receiver or sensor and a circuit for distinguishing light received from the light source of the interrogator means from ambient background light. In response to

> distinguishing the interrogation signal, the transponder is operative to transmit a coded radio frequency back to the RF receiver of the interrogator means to enable identification of the particular transponder and hence the barrier."

As described above, the circuit of Gamgee is employed to identify objects such as people and animals. In this respect, the signals are continuous analog type signals, not specific readings taken at discrete times as set forth, for example, in claim 1.

In addition, the Final Office Action maintains that Gamgee shows or suggests "determining when a difference between the first and second outputs are not significant as compared to a predetermined significance value/threshold (col. 2, lines 65, to col. 3, line 11)" as set forth above and reiterated here. In the Response to the first Office Action, Applicants noted that at column 2, lines 65, through column 3, lines 11, Gamgee states:

> "The detector means 22 is responsive to an increase in the background signal level component to increase or generally maintain the discrimination of an information signal component of the sensing signal 21 generated upon reception by the incident signal sensing means 20 of an information signal superimposed on background signal level. The sensing means 20 is sensitive to incident radiation and generates an output sensing signal 21 of a level related to the intensity of incident radiation 10. The detector means 22 is responsive to the sensing signal 21 to detect in the sensing signal 21 an information signal component superimposed on background radiation component. The sensing means has a variable operating point which determines its operating characteristics. The sensing means 20 generates, in response to incident radiation 10, an output signal 21 of magnitude related to the incident radiation level up to a saturation level of the output signal 21, beyond which saturation level, any changes in incident radiation level do not produce significant changes in magnitude of the output sensing signal 21. The discriminating apparatus includes a compensating circuit 26 operative in response to any variations in background radiation intensity level within a desired range to adjust the operating point of the incident radiation sensing means 20 so as to maintain the level of the sensing signal 21 below the saturation level."

In discussing the above teaching of Gamgee at column 2, lines 65, through column 3, lines 11, Applicants stated:

> "In this respect, Gamgee discusses discrimination between an information component and a background or noise component in the same signal. There are not two measures of light output of an LED

> that are taken at different periods of time as described in claim 1. In addition, there is no comparison between a first measure of a light output and a second measure of a light output with a predefined different threshold. In fact, no comparison is performed. Accordingly, Applicants assert that the element of "detecting a saturation of the sensors in the sensor array by comparing the difference between the first measure of the light output and the second measure of the light output with a predefined threshold" as set forth in claim 1 is not shown or suggested by Gamgee."

In the Response to Applicants' arguments, the Examiner quoted Applicants' argument above and further stated:

> "The Examiner maintains that the invention of Gamgee teaches a method for detecting saturation wherein a "sensing means 20 generates, in response to incident radiation 10, an output signal 21 of magnitude related to the incident radiation level up to a saturation level of the output signal 21, beyond which saturation level, any changes in incident radiation level do not produce significant changes in magnitude of the output sensing signal 21." (Final Office Action, page 7).

Once again, Applicants respectfully disagree with this contention. The above citation to the language of Gamgee cited by the Examiner merely evidences the fact that Gamgee recognizes that sensors must operate in a relative operating range in order to provide reliable readings. In this manner, circuitry is employed to ensure that a sensor functions within an operating range typically specified by a manufacturer of the sensor. If circuitry is not properly employed to ensure a sensor stays in its operating range, then it is possible that a sensor may become saturated and the sensor output will not change appreciatively in response to a changing input. In order to avoid a saturation of a sensor, Gamgee provides for:

> "a compensating circuit operative in response to any variation in background radiation intensity level within a desire range to adjust the operating point of the incident radiation sensing means so as to maintain the level of the sensing signal below the saturation level." (Gamgee, column 2, lines 5-10)

Thus, Gamgee merely teaches the use of a compensating circuit so that operating point of the sensor is adjusted so as to prevent saturation. The compensating circuit is the subject of design before the circuit is constructed. In this respect, designers prevent the sensor from becoming saturated with the compensation circuit. There is no circuitry in Gamgee that actively detects the saturation level itself. Rather, at design time the saturation level of the sensor is

known by the designers and circuitry is generated to prevent such from happening. As such, Gamgee does not show or suggest circuitry that actually detects the saturation level of a sensor as set forth by the various embodiments of the present invention.

The various embodiments of the present invention take into account that the sensors may include saturation points that vary over time. Gamgee fails to take this concept into account. Consequently, it is possible that the saturation point of a sensor of Gamgee might change over time and become saturated. Gamgee does not address this possibility and, consequently, teaches away from the various embodiments of the present invention as set forth in claim 1.

In addition, Gamgee contemplates providing a sensor that generates an analog output signal that is constant and continuous rather than producing first and second magnitude outputs at first and second times that are related to first and second light source intensities. Since multiple values are not acquired as set forth by Gamgee, it is also the case that a difference between first and second outputs are not compared with a predefined value or threshold. Accordingly, Applicants assert that the Examiner has misinterpreted the fair teaching of Gamgee in this respect.

Even in view of the statements above, the Final Office Action further states:

> "Therefore Gamgee teaches that the sensing means generates a first output signal related to a first incident radiation. The sensing means then generates a second output, of a plurality of subsequent output signals, related to a second incident radiation, of a plurality of subsequent incident radiations, and repeats the process up until a saturation level is detection. The saturation level is detected by determining when a difference between the first and second incident radiation levels does not produce a significant difference between the magnitude of the first and second output signals. Further, in order to determine whether the difference between the magnitudes of the first and second output signals, it is considered inherent that the difference must be compared to some type of threshold to indicate that the difference is not significant." (Final Office Action, Response to Arguments, page 8)

Applicants respectfully disagree. Gamgee merely teaches the fact that sensors can be saturated such that the output produced by them does not vary in response to a varying input once saturation is reached. In order for the circuit of Gamgee to operate properly, a compensation circuit is designed to ensure that the sensor continually operates in an operational range so that saturation is avoided. However, the avoidance of saturation is accomplished not by detecting where

saturation exists as asserted by the Examiner. Rather, the saturation is avoided by providing a compensation circuit specified at design time that adjusts the operating point of the sensor.

In addition, Gamgee teaches the generation of a constant analog signal from the sensor, not multiple readings as assumed by the Examiner. Gamgee does not generate a first output signal related to a first radiation and a second output related to a second radiation. Also, Gamgee does not repeat the process until saturation level is detected. Rather, Gamgee merely receives incident radiation and generates an output signal whereby, wherein the compensation circuit ensures that the sensor does not become saturated over time as the background noise of the incoming incident radiant light changes with time. Thus, in this respect, Gamgee teaches away from the various embodiments of the present invention.

The statement by the Examiner that "the saturation level is detected by determining when a difference between first and second incident radiation levels does not produce a significant difference between the first and second output signals" assumes too much. Gamgee does not include circuitry that makes any comparisons between any particular readings to attempt to find a saturation level. Gamgee doesn't even acknowledge the fact that the saturation levels may change over time in sensors as degradation occurs. As stated above, Gamgee does not discuss determining a difference between first and second incident radiation levels. Rather, at column 2, lines 49-58, Gamgee discusses separate components of the same signal--*only one signal output is generated*. According to embodiments of the present invention, the saturation levels are actively detected during the calibration process so that changes in the saturation levels of sensors over time can be compensated for in automated recalibration.

Not only does Gamgee fail to show or suggest determining a difference between first and second incident radiation levels, or even the detection of first and second incident radiation levels themselves, Gamgee fails to show or suggest the concept of comparing the difference between the magnitudes of the first and second output signals with a threshold. The Examiner states that such a feature is inherent in the discussion of Gamgee. However, given that Gamgee merely discusses the concept that sensors have saturation levels that are avoided by the proper design of compensation circuitry, there is no discussion of comparison of different magnitudes

as no comparisons are performed. The Examiner's contention of inherency of the stated elements above in Gamgee are misplaced.

In addition, Shiota fails to show or suggest such an element as well. In particular, Shiota describes setting a voltage applied to an LED light source based upon a feedback signal from a sensor. There is no comparison of a difference between two measures of the light output of the light source with a predefined difference threshold in an attempt to detect a saturation of the sensors.

Accordingly, Applicants assert that the rejection of claim 1 in view of the combined references is improper. Applicants also assert that the rejection of claims 7, 13, 19, and 20 is improper to the extent these claim include elements similar in scope with that of claim 1 above. Accordingly, Applicants respectfully request that the board overturn the rejection of claims 1, 7, 13, 19, and 20. In addition, Applicants request that board overturn the rejection of claims 2-4, 8-10, and 14-16 as depending from claims 1, 7, and 13, respectively.

2. **The Cited Prior Art Teaches Away from the Claimed Invention**

In addition, where the structure or text of prior art suggest something other than the instant invention, then they teach away from the invention and, ultimately, do not suggest the creation of the invention. Akzo N.V. v U.S. Intern. Trade Comm., 808 F.2d 1471 (Fed. Cir. 1986), *cert. denied*, 482 U.S. 909. In addition, Gamgee teaches the generation of a constant analog signal from the sensor, not multiple readings as assumed by the Examiner. Gamgee does not generate a first output signal related to a first radiation and a second output related to a second radiation. Also, Gamgee does not repeat the process until saturation level is detected. Rather, Gamgee merely receives incident radiation and generates an output signal whereby, wherein the compensation circuit ensures that the sensor does not become saturated over time as the background noise of the incoming incident radiant light changes with time. Thus, in this respect, Gamgee teaches away from the concept of obtaining and comparing multiple measurements to determine saturation as set forth in the claims of the present invention. As a result, Applicants assert that any citation to Gamgee in rejecting the present claims can only be the product of hindsight reconstruction using the claims of the present application as a blueprint.

3. Lack of Motivation or Suggestion to Combine References

In addition, it is well settled that where multiple references are relied upon in combination for an obviousness rejection, there must be some teaching, suggestion, incentive or inference to make the proposed combination. Carella v. Starlight Archery, 804 F.2d 135, 231 USPQ 644 (Fed. Cir 1986). In citing motivation to combine Lisson, Gamgee, and Shiota, the first Office Action states:

> "It would have been obvious to one having ordinary skill in the art to modify the invention of Lisson to include a corresponding means for determining the occurrence of the saturation of specify that the image sensor be part of a scanner with and LED as the light source, as taught by Gamgee, because Lisson teaches altering a current supply to a light source until saturation is detected, but provides no method for determining such saturation and the invention of Gamgee suggests that the combination would have provided a method for determining the saturation when an intensity is altered up to a saturation point (col. 1, lines 61-64) by employing a common relationship (col. 1, lines 64-68) thereby accurate determination of when the maximum intensity has been reached." (Office Action, pages 4-5)

Applicants respectfully disagree. In particular, Gamgee does not show or suggest the determination of saturation. Rather, Gamgee teaches discrimination between an information component and a noise component of a particular signal. Thus, the statement that Gamgee suggests that "the combination would have provided a method for determining the saturation when an intensity is altered up to a saturation point by employing a common relationship, thereby accurate determination of when the maximum intensity has been reached" makes no sense in light of what is actually taught by Gamgee. In addition, the statement that "Lisson teaches altering current supplied by a light source until saturation is detected" is incorrect. Specifically, Lisson teaches the fact that the current may be altered to a light source such that the intensity of the light source changes up to the point that saturation is achieved where no more differences occur even though greater intensities of light are created. Thus, there is no actual detection of a saturation point as described by Lisson. Rather Lisson merely discusses the fact that sensors will become saturated when the intensity of the light that falls incident to the sensing surfaces is too great.

Nonetheless, in Response to the above arguments, in the Final Office Action, the Examiner states:

> "The Examiner maintains that the invention of Gamgee does show the determination of saturation stating, "sensing means 20 generates, in response to incident radiation 10, an output signal 21 of magnitude related to the incident radiation level up to a saturation level of the output signal 21, and which saturation level, any changes in incident radiation level do not produce significant changes in magnitude of the output sensing signal 21" (column 3, lines 5-11)..."

For the reasons described above, Applicants maintain the assertion that Gamgee does not show or suggest the determination of saturation levels. Rather, Gamgee merely shows or suggests the concept that sensors can be saturated and they must be compensated for properly to ensure proper operation without saturation. All assertions that Gamgee shows the concept of determining saturation especially by taking measurements and comparing differences between measurements as described in claim 1, for example, assume too much from the teachings of Gamgee and are the product of the hindsight reconstruction. Also, Applicants assert that the statements in the Office Action that "Lisson does teach altering current supplied to a light source until saturation is detected" is incorrect as mentioned above.

Thus, Applicants assert that the cited motivation to combine the above cited references is illusory and non-sensical in view of the actual teachings of the cited references. In this respect, Applicants assert that the combination of references cited in the Office Action can only reasonably be made with the use of impermissible hindsight construction.

In view of the forgoing, Applicants once again assert that the cited rejection of claim 1 fails to show or suggest at least the step of "detecting a saturation of the sensors in the sensor array by comparing a difference between the first measure of the light output and the second measure of the light output with a predefined difference threshold." Rather, to generate the instant rejection of claims 1-4, 7-10, 13-16, 19, and 20 under §103(a), the Examiner misinterprets the teachings of the cited references as suggesting the claimed elements of the present invention. In addition, the cited references teach away from the claimed invention and the Examiner fails to cite a legitimate motivation to combine the cited references. Accordingly, Applicants respectfully request the Board to overturn the Examiner's rejection of the claims.

B. REJECTION OF CLAIMS 5, 6, 11, 12, 17, and 18:

Claims 5, 6, 11, 12, 17, and 18 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Lisson in view of Gamgee and Shiota, and further in view of U.S. Patent 4,982,203 issued to Uebbing et al. (hereafter "Uebbing"). For the purposes of the following argument, Applicants discuss the traversal of the rejection of claims 5, 6, 11, 12, 17, and 18 with a discussion of representative claim 5. Claim 5 provides as follows:

> 5. The method of claim 1, wherein the step of detecting the saturation of the sensors in the sensor array by comparing the difference between the first measure of the light output and the second measure of the light output with the predefined difference threshold further comprises calculating the difference by determining a percent increase of the second measure over the first measure.

Applicants respectfully submit that claim 5 patently distinguishes over, and is not rendered obvious by the cited combination of Lisson, Gamgee, Shiota, and Uebbing.

1. The Combination of References Fails to Suggest All of the Claimed Limitations.

It is well settled law that a prima facie case of obviousness is established when the teachings from the prior art itself would appear to have shown or suggested the claimed subject matter to a person of ordinary skill in the art. In re Rijckaert, 9 F.3d 1531, 28 U.S.P.Q2d 1955, 1956 (Fed. Cir. 1993). Claim 5 recites the additional step of calculating the difference by determining a percent increase of the second measure of the light output of the LED over the first measure of the light output of the LED. Note that claim 6 recites determining a percent decrease in a similar manner.

With respect to claim 5, the Final Office Action repeated the rejection of the First Office Action stating:

> "As noted above, Lisson in combination with Gamgee and Shiota teaches many of the features of the claimed invention, and while combination teaches incrementing/decrementing the current in order to obtain an optimal value, the combination does not specifically teach determining the amount the current is to be changed using percentages.
>
> Uebbing teaches a method and apparatus for improving the uniformity of an LED printhead by compensating for the degradation in light output of a plurality of LEDs (column 4, lines 66-68) comprising

> obtaining the light output measures of two different pulse-width values and comparing the difference between these values to determine the percentage increase, of the second measure relative the first measure, needed to meet the desired output level deviation/difference (column 5, lines 1-22)." (Final Office Action, page 5).

Once again, Applicants disagree with the above assertion. Uebbing merely teaches measuring the light output of LEDs at two separate times to determine a degradation of light output over the time period between measurements. In this respect, Uebbing is not detecting a "percentage increase" between the two measurements, but the amount of degradation in the light output. In addition, Uebbing does not suggest determining "the percentage increase, of the second measure relative to the first measure, needed to meet the desired output level deviation/difference (in this case zero)." There is no "desired output level deviation/difference" that is to be reached. Rather, the amount of light output degradation is determined between the measurements and the pulse width is adjusted to compensate. Applicants ask precisely where does Uebbing suggest the calculation of a percentage difference? Given that the degradation of the sensors over time is all that is measured, there is no need to calculate a percentage difference of the second measure relative to the first measure. The degradation is determined directly and the pulse width is adjusted to compensate. What would calculating a percentage difference accomplish? In this respect, Uebbing teaches away from calculating a percentage difference as claimed.

Claims 11-12 and 17-18 recite elements similar in scope with those of claim 5 above. Applicants assert for the reasons above, the cited combination of references fails to show or suggest the elements of claims 5, 6, 11, 12, 17, and 18. Accordingly, Applicants respectfully request the Board to overturn the Examiner's rejection of the claims.

2. <u>Lack of Motivation or Suggestion to Combine References</u>

In addition, it is well settled that where multiple references are relied upon in combination for an obviousness rejection, there must be some teaching, suggestion, incentive or inference to make the proposed combination. <u>Carella v. Starlight Archery</u>, 804 F.2d 135, 231 USPQ 644 (Fed. Cir 1986). Applicants assert that the Examiner has failed to cite a proper motivation to combine Lisson, Gamgee, Shiota,

and Uebbing for the same reasons described above with respect to the combination of Lisson, Gamgee, and Shiota.

In view of the forgoing, Applicants once again assert that the cited rejection of claim 5 fails to show or suggest at least the step of "calculating the difference by determining a percent increase of the second measure over the first measure." Rather, to generate the instant rejection of claims 5, 6, 11, 12, 17, and 18 under §103(a), the Examiner misinterprets the teachings of the cited references as suggesting the claimed elements of the present invention. In addition, the Examiner fails to cite a legitimate motivation to combine the cited references. Accordingly, Applicants respectfully request the Board to overturn the Examiner's rejection of the claims.

VIII. <u>CONCLUSION:</u>

In view of the foregoing, Applicants assert that claims 1-20 are in proper condition for allowance, and the Board is respectfully requested to overturn the Examiner's rejections of these claims.

Authorization is provided in the documents accompanying this Appeal Brief to charge Applicant's deposit account for the amount of $500.00 to cover the fee associated with filing this Appeal Brief. If any additional fees are required for this Appeal Brief to be considered, Applicant hereby authorizes the Board to charge any additional fee that may be required to deposit account 08-2025.

Respectfully submitted,

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IX. CLAIMS APPENDIX:

The claims as currently pending are as follows:

1. A method for determining a light output of a light emitting diode (LED) in a scanner, comprising:

applying a first current to the LED to generate the light output of the LED during a first time period;

obtaining a first measure of the light output of the LED during the first time period with a number of sensors in a sensor array;

applying an altered current to the LED to generate the light output of the LED during a second time period;

obtaining a second measure of the light output of the LED during the second time period with the sensors in the sensor array; and

detecting a saturation of the sensors in the sensor array by comparing a difference between the first measure of the light output and the second measure of the light output with a predefined difference threshold.

2. The method of claim 1, further comprising:

providing an LED current control circuit coupled to the LED; and

wherein the step of applying the first current to the LED and the step of applying the altered current to the LED further comprise manipulating the LED control circuit to generate the first and altered currents.

3. The method of claim 1, further comprising incrementing the first current by a predefined amount to obtain the altered current.

4. The method of claim 1, further comprising decrementing the first current by a predefined amount to obtain the altered current.

5. The method of claim 1, wherein the step of detecting the saturation of the sensors in the sensor array by comparing the difference between the first measure of the light output and the second measure of the light output with the predefined difference threshold further comprises calculating the difference by determining a percent increase of the second measure over the first measure.

6. The method of claim 1, wherein the step of detecting the saturation of the sensors in the sensor array by comparing the difference between the first measure of the light output and the second measure of the light output with the predefined difference threshold further comprises calculating the difference by determining a percent decrease of the second measure relative to the first measure.

7. A system for determining a light output of a light emitting diode (LED) in a scanner, comprising:

a processor circuit having a processor and a memory;

an LED current control circuit coupled to the processor circuit and the LED;

current control logic stored on the memory and executable by the processor, the current control logic comprising:

logic for directing the LED current control circuit to apply a first current to the LED for a first time period to generate a first measure of the light output of the LED during the first time period from a number of sensors in a sensor array in the scanner;

logic for directing the LED current control circuit to apply an altered current to the LED for a second time period to generate a second measure of the light output during the second time period from the number of sensors in the sensor array; and

logic for detecting a saturation of the sensors in the sensor array by comparing a difference between the first measure of the light output and the second measure of the light output with a predefined difference threshold.

8. The system of claim 7, wherein each of the sensors in the sensor array generate a signal representing the light output of the LED when illuminated thereby.

9. The system of claim 7, wherein the current control logic further comprises logic for incrementing the first current by a predefined amount, thereby generating the altered current.

10. The system of claim 7, wherein the current control logic further comprises logic for decrementing the first current by a predefined amount, thereby generating the altered current.

11. The system of claim 7, wherein the logic for detecting the saturation of the sensors in the sensor array by comparing the difference between the first measure of the light output and the second measure of the light output with the predefined difference threshold further comprises logic for calculating the difference by determining a percent increase of the second measure over the first measure.

12. The system of claim 7, wherein the logic for detecting the saturation of the sensors in the sensor array by comparing the difference between the first measure of the light output and the second measure of the light output with the predefined difference threshold further comprises logic for calculating the difference by determining a percent decrease of the second measure relative to the first measure.

13. A system for determining a light output of a light emitting diode (LED) in a scanner, comprising:

means for applying a first current to the LED for a first time period to generate a first measure of the light output of the LED from a number of sensors in a sensor array during the first time period;

means for applying an altered current to the LED for a second time period to generate a second measure of the light output from the sensors in the sensor array during the second time period; and

means for detecting a saturation of the sensors in the sensor array by comparing a difference between the first measure of the light output and the second measure of the light output with a predefined difference threshold.

14. The system of claim 13, wherein the sensors generate a signal representing the light output of the LED when illuminated thereby.

15. The system of claim 13, further comprising means for incrementing the first current by a predefined amount to obtain the altered current.

16. The system of claim 13, further comprising means for decrementing the first current by a predefined amount to obtain the altered current.

17. The system of claim 13, wherein the means for detecting the saturation of the sensors in the sensor array by comparing the difference between the first measure of the light output and the second measure of the light output with the predefined difference threshold further comprises means for calculating the difference by determining a percent increase of the second measure over the first measure.

18. The system of claim 13, wherein the means for detecting the saturation of the sensors in the sensor array by comparing the difference between the first measure of the light output and the second measure of the light output with the predefined difference threshold further comprises means for calculating the difference by determining a percent decrease of the second measure relative to the first measure.

19. A method for determining a light output of a light emitting diode (LED) in a scanner, comprising:

providing an LED current control circuit coupled to the LED;

providing a number of sensors in a sensor array, the sensors generating a signal representative of the light output of the LED when illuminated thereby;

manipulating the LED current control circuit to apply a first current to the LED for a first time period to generate the signal representing a first measure of the light output of the LED from each of the sensors during the first time period;

manipulating the LED current control circuit to apply an altered current to the LED for a second time period to generate a second signal representing a second measure of the light output from each of the sensors during the second time period; and

detecting a saturation of the sensors in the sensor array by comparing a difference between the first measure of the light output and the second measure of the light output for each of the sensors with a predefined difference threshold.

20. A system for determining a light output of a light emitting diode (LED) in a scanner, comprising:

an LED current control circuit coupled to the LED;

a number of sensors in a sensor array, the sensors generating a signal representative of the light output of the LED when illuminated thereby;

a processor circuit having a processor and a memory;

current control logic stored on the memory and executable by the processor, the current control logic comprising:

logic to direct the LED current control circuit to apply a first current to the LED for a first time period to generate a signal representing a first measure of the light output of the LED from each of the sensors during the first time period;

logic to direct the LED current control circuit to apply an altered current to the LED for a second time period to generate a second signal representing a second measure of the light output for each of the sensors during the second time period; and

logic to detect a saturation of the sensors in the sensor array by comparing a difference between the first measure of the light output and the second measure of the light output for each of the sensors with a predefined difference threshold to detect an optimum light output for each of the sensors.

X. Evidence Appendix:

No evidence is offered herein.

XI. Relating Proceedings:

There are no copies of decisions rendered by a court or the Board to be provided herewith.